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10 IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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TITLE: DOOR BREACH TRAINING SYSTEM AND
METHOD OF USE

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2 BACKGROUND OF THE INVENTION

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4 1. Field of The Invention

5 The present invention relates to training devices for
6 public safety officers and cadets.

7

8 2. Background Information

9 Public Safety personnel (e.g. fire fighters, police,
10 sheriff, SWAT team, FBI and ATF officers), as well as military
11 personnel are often faced with the need to perform a forced
12 entry into structures. A forced entry can be, and often is a
13 life-threatening scenarios, where every second counts.

14 Variations in door breaching technique, how ever slight,
15 as well as practice and conditioning for the operation are
16 vital in shaving seconds from the operation - seconds which
17 can span the difference between life-saving tactical surprise
18 and life-ending ambush.

19 Presently, forced entry training is performed using
20 conventional doors and door frames. While this certainly
21 provides realistic training opportunities, such an approach is
22 quite costly for self-evident reasons (not only the cost of
23 constantly replenishing door supplies, but the installations.

1 costs as well). While few would admit (even if aware of the
2 fact) to trading off life-saving training for savings in door
3 costs, many training facilities are thorough to limit door
4 breach training to something of a practical minimum, simply
5 because of the present cost implications.

6 Clearly, it would well serve those who perform emergency
7 or law enforcement-related door breaching operations, as well
8 as those civilians whose lives often depend on such operations
9 (entrapped fire victims and hostages, for example) to provide
10 an alternative means of training for door breach operations,
11 which, because of considerably favorable cost efficiency when
12 compared to conventional training options, and resulting lower
13 resistance to more thorough and repeated practice training,
14 results in more effective implementation of door breaching
15 operations in the field.

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17 SUMMARY OF THE INVENTION

18 In view of the foregoing, it is an object of the
19 present invention to provide a novel, unobvious and
20 beneficial door breach training system and related method of
21 use thereof for use in cost-effectively training public
22 safety, law enforcement and military personnel in door
23 breach operations.

1 It is another object of the present invention to
2 provide a door breach training system and related method of
3 use thereof for use by public safety, law enforcement and
4 military personnel in training for door breach operations,
5 which system and method obviates the need for destruction of
6 conventional doors and the associated costs related thereto.

7 It is another object of the present invention to
8 provide a door breach training system and related method of
9 use thereof for use by public safety, law enforcement and
10 military personnel in training for door breach operations,
11 which system and method facilitates repeated training
12 exercises without the consumption of expensive supplies or
13 equipment.

14 It is another object of the present invention to
15 provide a door breach training system and related method of
16 use thereof for use by public safety, law enforcement and
17 military personnel in training for door breach operations,
18 which system and method permits training for breaching doors
19 of differing breach resistance without substantial or
20 expensive modification to such system.

21 In satisfaction of these and related objects, the
22 present invention provides a door breach training system and
23 associated method for use thereof in the training of public

1 safety, law enforcement and military personnel for door
2 breach operations. The system and method is based, in its
3 preferred mode, on a substantially indestructible
4 (relatively speaking) door and frame assembly which, despite
5 its substantial resistance to literal destruction in the
6 conventional sense, is user-configurable to present varying
7 degrees of resistance to breach in order to mimic real world
8 doors of varying breach-resistant characteristics (hollow,
9 solid, wood, metal, reinforced, etc.). The system includes
10 user-replaceable shear pins which are engineered to shear
11 substantially at known force levels which, respectively,
12 present the breach resistance of the varying door types just
13 mentioned.

14 After each use of the present system, the then sheared
15 pins are simply replaced (with very inexpensive replacement
16 pins) for the next exercise, with no need to replace an
17 expensive door or frame, and very little time involved to
18 "re-set" the system.

19 The present system is believed to present an
20 opportunity for substantial savings to training facilities
21 and their sponsor organizations, as well as provide a subtle
22 incentive for more thorough, frequent and effective training
23 in vital door breach operations.

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2 BRIEF DESCRIPTION OF THE DRAWINGS

3 Fig. 1 is a perspective view of the door breaching
4 training system of the present invention.

5 Fig. 2 is a second perspective view of the door
6 breaching training system of the preferred embodiment.

7 Fig. 3 is a perspective view of the preferred
8 embodiment of the replaceable pin of the present invention.

9 Fig. 4 is a sagittal cross sectional view of the pin of
10 Fig. 3 shown received within door frame and door sockets as
11 in a pre-exercise position.

12 Fig. 5 depicts specific dimensions and geometry of the
13 preferred pin for use in the present system and method.

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15 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

16 Referring to Figures 1 and 2, the door breach training
17 system of the present invention is identified generally by
18 the reference numeral 10. System 10 includes a door 12 and
19 an associated door frame 14.

20 To simulate the locks within the training system,
21 embodiments of the present invention include door sockets
22 16, frame sockets 18, and shear pins 20.

1 Door sockets 16 are inserted into door 12, while frame
2 socket 18 is inserted into the door frame 14. The number of
3 door sockets 16 and corresponding frame sockets 18 utilized
4 for any given exercise can be user-varied to represent the
5 number of locks, or the over-all breach resistance to be
6 simulated in any given exercise.

7 Referring in combination to Figs. 1, 2 and 3, to
8 complete a set-up for an exercise, door 12 is placed in its
9 conventional "closed" position relative to door frame 14,
10 and the appropriate pin(s) 20 for representing the desired
11 condition (such as wood door and metal frame, etc) are
12 inserted to engage the bores 22 and 24, respectively, of
13 both door sockets 16 and frame sockets 18

14 Upon forced entry of a trainee, the resistance force of
15 pin(s) 20 simulates that encountered in field forced entry.
16 Once door 12 has been breached or entered, pin(s) 20 are
17 simply removed and the system 10 can be reset for the next
18 trainee.

19 By collecting data from numerous physical breaching
20 tests on doors and frames of different construction, an
21 engineered pin has been developed which when utilized in the
22 designed system replicates the same forces and impact
23 resistance found in field conditions as encountered by

1 public safety personnel. The engineered pins not only
2 involve the shape and form of the pin but also the material
3 properties of construction. This results in various pin
4 types being used to simulate various conditions. When
5 utilized with a fortified door and frame, the overall system
6 is engineered to fail in a controlled, repeatable and
7 measurable manner with the pins being the only consumable
8 for training.

9 Referring to Figs. 3, 4 and 5, the preferred pins 20
10 for use in embodiments of the present invention are made of
11 unfilled polycarbonate with a known shear strength of 4675
12 psi, and are configured as shown. The core hole 26 of each
13 pin 20 will vary, depending on the type of pin 20 to be
14 constructed. For example, a "wood frame type" pin 20 will,
15 when made of the above polycarbonate, material, and
16 according to the depicted geometry, have a core hole
17 diameter of .303 inches (for a resulting .121 sq. inch
18 material for this type pin 20), a "metal frame type" pin 20
19 will have a .217 diameter (for a resulting .217 sq. inch
20 material for this type pin 20), and a reinforced type pin 20
21 will have no core hole at all.

22 By the use of test data from physical testing of
23 various combinations of door and frame construction, pin 20

1 constitutes a preferred, calculated geometry (shown in Fig.
2 5) and material property, which results in a failure
3 replicating that of the test data. This allows pins of
4 identical overall dimension, but varying internal geometry
5 (bore size of sockets 22 and 24) and material property to be
6 utilized in the same sockets while simulating totally
7 different breaching scenarios or conditions. Clearly
8 variations of the depicted geometry, dimensions and/or
9 materials will still fall within the scope of the present
10 invention, but those shown are now believed to be optimal,
11 based on present tests and analysis.

12 Tests by the present inventor reveal that the average
13 wood frame door with a single bolt (deadbolt or doorknob
14 type) required approximately 480 lbs. pressure for door
15 breach, while a metal frame door of the same configuration
16 required an average 645 lbs. of pressure. The addition of
17 more locks or bolts varies the pressure.

18 If using the presently engineered pins as previously
19 described, the following are examples of appropriate
20 configurations for training exercises:

21 Wood frame door with doorknob bolt and additional
22 deadbolt - Use 2 "wood type" pins 20 for breaching
23 force requirement of 960 lbs;

1 Metal frame door with doorknob bolt and additional two
2 deadbolts - Use 3 "metal type" pins 20 for
3 breaching force requirement of 1935 lbs; and
4 Reinforced door - Use 3 "reinforced type" pins 20 for
5 breaching force requirement of 2640 lbs.

6 Note that all holes are tapered 4° from the opening at the
7 open end of pin 20.

8 Clearly, variations in pin configuration and material
9 constituency can vary the pin requirements for the above
10 examples, but an analogous concept would fall within the
11 scope of the present invention.

12 Although the invention has been described with
13 reference to specific embodiments, this description is not
14 meant to be construed in a limited sense. Various
15 modifications of the disclosed embodiments, as well as
16 alternative embodiments of the inventions will become
17 apparent to persons skilled in the art upon the reference to
18 the description of the invention. It is, therefore,
19 contemplated that the appended claims will cover such
20 modifications that fall within the scope of the invention.